

Serial No. 08/880,616  
Art Unit No. 2755

94 8/17 17. (Amended) The method of Claim 14 further comprising the step of interleaving execution of local tasks [local operations] with said executing of said tasks of more than one application.

REMARKS

The Examiner has rejected the pending Claims 1-17 under 35 USC § 103 as unpatentable over the teachings of the Cameron patent in view of the admitted prior art regarding the AIX technology. The Cameron patent is directed to the scheduling of tasks across multiple nodes (with node defined at Column 2, line 40 as a single processor location) wherein, as specifically stated in Column 2, lines 53-58 and again at Column 7, lines 37-42, "...only one application program is active at a time on any one node and an entire application program is active at once across all of the nodes on which the application program is loaded." While the Cameron patent does state that more than one application program may be loaded on a single node, it clearly requires that only one application be active at any time on that node. The present invention, in contrast, provides for multiple tasks of multiple applications being active on the multiple processes of any given node at a

Serial No. 08/880,616  
Art Unit No. 2755

time. It is clear that the global allocating and scheduling system for single process nodes of the Cameron patent has neither the scheduling complexity nor the flexibility of the system and method claimed by the present application. While Figure 8 of present invention does show (for the purposes of illustrating average time savings) a scenario wherein all of the tasks of prioritized applications B, A, and C occupy all of the processes at each of the respective time intervals 0-10, 10-20 and 20-30, it is clear from the description (see: e.g., Page 8, lines 6-7 and Page 12, lines 10-13) that the different processes on a node can, as a result of the invention, be working on different applications at any given time.

With regard to the Examiner's analysis of the Cameron patent, on page 3, paragraph 6 of the Office Action, Applicants respectfully disagree with the interpretation of the scheduler means and the Cameron teachings found at Column 14, lines 33-42. The Cameron teachings with regard to interactive scheduling do not discuss any assignment of priorities when scheduling tasks, and clearly do not obviate the claimed method and means for dynamically creating a prioritized schedule of said plurality of tasks. The Cameron

Serial No. 08/880,616  
Art Unit No. 2755

interactive scheduling of tasks in time slices may be done on a first-in-first-out basis, with no regard to priorities. Furthermore, as acknowledged by the Examiner, Cameron does not teach a local scheduler for ascertaining which processes are assigned to tasks or a means for prioritizing the processes.

The Examiner has cited the admitted prior art for the AIX operating system as providing those teachings, local scheduler and prioritizer, missing from the Cameron patent. With respect to the Examiner's discussion of the AIX operating system, the Examiner states that "(h)aving the processes associated with individual tasks assigned priority corresponding to the priorities of the individual tasks would have been a highly desirable feature in the art." It is first to be noted that the AIX operating system, as discussed on pages 2 and 3 of the present Specification, assigns priorities to processes based on the scheduled tasks which have been assigned to those processes, with the premise that only one application's tasks are to be active at any given time (see: Page 3, lines 1-2). Assuming that only one application can be active at a time, the assigning of priorities of processes is simply a resource utilization mechanism to show the local scheduler what resources will be available after completion of

Serial No. 08/880,616  
Art Unit No. 2755

the tasks as assigned thus far. There is no suggestion in the AIX prior art that process priorities would be used for the purpose of anticipatory scheduling of multiple tasks of different applications to be active simultaneously.

Secondly, the AIX system is an operating system which tracks its resources as disclosed in the Specification, but is not a local scheduler which assigns process priorities independent of the operations of the local operating system, as is clearly set forth by the present application. There is no suggestion in the AIX teachings that the operating system receive input of process priorities from another entity nor that the local operating system then direct execution of more than one application's tasks based on those priorities.

It is respectfully contended that there is no suggestion, in either the Cameron patent or the prior art AIX literature, that the one could or should combine the teachings of those references. The Cameron patent is directed to a system having single process nodes wherein each executes a single task of a given single application at the same time that the other single process nodes are executing single tasks of that same application. The scheduling for the Cameron system is

Serial No. 08/880,616  
Art Unit No. 2755

conducted by a global allocator and scheduler which dynamically partitions the nodes for execution of a given single application. All resource (i.e., single process node) allocation is done by the global entity and all task scheduling and execution is overseen by that global entity. In contrast, the admitted prior art regarding the AIX system pertains to an operating system for a multi-process node which locally prioritizes its processes for performance of single tasks of a single application at those processes in order to track its resources. One would not be motivated to apply the AIX local operating system multi-process resource tracking mechanism to a Cameron system in which the use of a global scheduler obviates the need for operating system control of single process nodes.

Moreover, even with the combination of the Cameron and AIX teachings, one would not arrive at the present invention. The combination of teachings would yield a system wherein the Cameron global scheduler would assign priority values to processes at single process nodes, which for each single process node would necessarily be a single high priority value. Moreover, that single priority value would be the same for all of the single process nodes which are all running the

Serial No. 08/880,616  
Art Unit No. 2755

same application (a la the priority of 60 for processes 1, 3 and 5 from the AIX discussion in the present Specification on Page 3, lines 1-3), in the Cameron system where only one application is active on a given node and that same application is active on all nodes at the same time. No combination of the cited references yields the presently-claimed invention wherein process priorities are assigned at multi-process nodes for use by the operating systems for the effective scheduling of tasks of multiple applications, including those of a first priority application as well as those of any successive priority tasks from different applications and those of interleaved local tasks.

With respect to the interleaving of local tasks, the Examiner has stated that "(a) node or CPU controlled by an operating system would inherently process local operations pertaining to the operating system commands." The processing of local operations for the purpose of executing the assigned tasks is not the same as interleaving local tasks with the plurality of application tasks. What is clearly taught by the Specification is that local program processing, and not just local execution, is inserted into the process schedule wherever appropriate.

Serial No. 08/880,616  
Art Unit No. 2755

While it is apparent that the combination of teachings from the Cameron patent and the present application cannot be said to obviate the pending claim language, Applicants have amended the two independent claims to more clearly highlight the distinctions over the prior art, particularly with regard to the scheduling and prioritization of processes for execution of tasks from different applications. In addition, dependent Claims 3 and 17 have been amended to more clearly recite the interleaving of local tasks, rather than simply local operations necessary for the execution of the prioritized tasks.

Finally, with respect to the rejection of Claim 18 in light of the combined teachings of Cameron, the AIX teachings and the Belo patent, Applicants aver that the Belo patent does not provide those teachings missing from the combination of Cameron and AIX necessary to obviate Claim 18. To add the Belo patent teachings, of a cluster scheduler maintaining a register of priorities, into a system which combines the Cameron and AIX teachings would result in a system wherein the Cameron global scheduler would maintain a listing of the single application priorities assigned to each of the single

Serial No. 08/880,616  
Art Unit No. 2755


process nodes. Such clearly does not render the present invention obvious.

In light of the foregoing arguments, it is respectfully requested that the rejections based on the combined teachings of the Cameron patent and AIX material from the present application be withdrawn. Applicants request reconsideration of the claims as amended.

Respectfully submitted,

M.A. COHEN, ET AL

By:

  
Anne Vachon Dougherty  
Registration No. 10,374  
Tel. (914) 962-5910

Enclosures